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January 1966

TREATMENT OF CARCINOMA OF THE THYROID WITH SPECIAL REFERENCE TO USE OF RADIOACTIVE IODINE

GEORGE CRILE, JR., M.D.
Department of Surgery

RADIOACTIVE iodine is most effective in the treatment of well differentiated thyroid cancers. Since the majority of differentiated cancers are amenable to surgical cure, radioactive iodine is rarely required in these cases. Unfortunately, it is of no value in the highly malignant cancers in which it is most needed. For these reasons, *the usefulness of I^{131} is limited to the small group of carcinomas of low malignancy which have metastasized or extended beyond the scope of surgical removal.*

Role of I^{131} in the Treatment of Carcinoma of the Thyroid

Few carcinomas of the thyroid concentrate much radioactive iodine until the normal thyroid has been removed or destroyed with I^{131} . As long as the normal thyroid is functioning, its greater avidity for iodine precludes any significant concentration of I^{131} by the tumor tissue. However many differentiated tumors, which before the thyroid was removed took up little or no I^{131} , concentrate it satisfactorily after abolition of the function of the normal thyroid. Slight concentrations of radioactive iodine may occur even in tumors which seem to be quite undifferentiated, but in our experience the only tumors which can be made to concentrate I^{131} in therapeutic quantities are those which are well enough differentiated to have histologically demonstrable colloid. Two such tumors have been encountered in a series of 105 histologically proved cancers of the thyroid seen at the Cleveland Clinic in the past 5 years and, in both cases, pulmonary and cervical metastases have disappeared in response to treatment with I^{131} .

The take-up of radioactive iodine by most low grade carcinomas of the thyroid is irregular and spotty, certain areas concentrating large amounts and others none at all. Since the radiation given off by I^{131} penetrates only 1 to 3 mm. of tissue, a satisfactory uptake of I^{131} by certain parts of a tumor of the thyroid does not assure complete destruction of the entire tumor. Thus, although the functioning areas may take up enough radioactive iodine to destroy themselves, the more undifferentiated areas may receive almost no radiation. Perhaps under the influence of thyrotropic hormones these undifferentiated areas may be converted to functional tissue that concentrates I^{131} and may be destroyed by subsequent treatments, but there can be no assurance that all cells will be destroyed or that sooner or later, after the more differentiated parts of the tumor are destroyed, the undifferentiated portions will not begin

to grow again. For these reasons radioactive iodine therapy should not be relied upon.

During the past 5 years the commonest single type of carcinoma of the thyroid has been the papillary carcinoma, which constitutes 63 per cent of the cases seen at the Cleveland Clinic. The average age of patients with papillary carcinoma of the thyroid is only 34; 39 per cent are under 30 years of age and 19 per cent are under 20. Since many of these cancers occur in young women and girls and since large doses of radioactive iodine are required to destroy cancers of the thyroid, the question of effect of the radiation on menstruation and child bearing arises.

I^{131} usually can be given in divided doses up to 100 mc. without permanent effect on menstruation, but with larger doses there is danger of permanently destroying ovarian functions. Moreover, total and permanent myxedema must be produced if thyroid cancer is to be treated successfully with I^{131} . For these reasons it is clear that in girls or young women I^{131} should be used only as a last resort and should be reserved for those cases in which there are distant metastases or inoperable local recurrences.

X-ray Therapy

Papillary carcinoma of the thyroid is not often sensitive to x-ray therapy and complete primary regression of the tumors has not occurred in any of the cases in which we have employed it. Since radiation increases the technical difficulty of dissection of the nodes of the neck and is of questionable value in the control of papillary carcinoma, x-ray should not be employed except as a final measure when surgery and radioactive iodine have failed.

X-ray therapy has been of little value in the treatment of the more malignant types of thyroid cancer, although occasionally and unpredictably a satisfactory primary regression is observed. Since the more malignant tumors are rarely curable by operation and since they do not concentrate I^{131} roentgen therapy is the only hope and should be given a trial.

Surgery

The best treatment of carcinoma of the thyroid is surgical excision. Fortunately nearly 70 per cent of all cancers of the thyroid are tumors of low malignancy which remain localized in the thyroid or metastasize only locally to the cervical lymph nodes. Even when extensive cervical metastasis is present the prognosis in these cases is excellent, nor does the histologic invasion of blood vessels by tumor cells materially alter the good prognosis in tumors of low malignancy such as the papillary carcinomas.

In approximately 85 per cent of the cases of carcinoma of the thyroid a definite diagnosis can be made prior to operation, and in an additional 10 per cent the diagnosis of carcinoma can be suspected. In the remaining 5 per cent the diagnosis usually can be made in the operating room from the gross appearance of the tumor. It is therefore possible, in almost all cases, to establish or

suspect the diagnosis of carcinoma before the patient leaves the operating room and to perform a primary operation which will be adequate to insure the best possible chance of recovery.

A curative operation for carcinoma of the thyroid entails complete excision of the lobe of the thyroid on the affected side. In cases in which the tumor is multicentric or involves both lobes, all of the thyroid should be removed. Total lobectomy cannot be accomplished safely without identification and dissection of the recurrent laryngeal nerve, and when both lobes are removed great care must be taken to preserve the parathyroids if this can be done without danger of leaving tumor tissue. These operations are tedious and involve extensive anatomic dissection of the important structures of the neck.

The lymph nodes which are involved by metastasis from papillary carcinomas of the thyroid are the group behind the thyroid and along the course of the recurrent nerve, the nodes of the superior mediastinum, and the deep nodes around and behind the carotid sheath. Frequently a midline node just above the thyroid also is involved.

Since the metastases of papillary carcinoma in the cervical lymph nodes remain localized for long periods of time and do not tend to invade muscle or adjacent structures, it is not necessary to remove the sternomastoid muscle or to perform mutilating block dissection of the neck on young girls with papillary carcinoma. On the other hand, operations in which the primary tumor or its metastases are cut into or removed incompletely may disseminate and implant the tumor in such a way that the tumor becomes invasive and radical operations are necessary involving sacrifice of muscle and other important structures. Since secondary operations done in the presence of scar tissue and invasive tumor are always more difficult than the primary procedure, and are attended by a diminished rate of cure, it is most important to eradicate the tumor completely in the area of the neck operated upon and to avoid doing partial and incomplete surgery that might necessitate repetition. Eradication can be accomplished satisfactorily and without mutilation by one or more carefully planned procedures in which the involved groups of nodes are removed completely. No harm will be done if nodes which were not palpable at the time of the first operation appear at a later date contralaterally or in a triangle of the neck which has not been operated upon before because these nodes can be removed cleanly during a secondary procedure without altering the good prognosis.

Results of Surgery in Treatment of Carcinoma of the Thyroid

In a consecutive series of 28 papillary carcinomas of the thyroid in which the first operation was performed in accordance with the principles stated, all but one of the patients are alive, well and apparently free of recurrence for from 3 to 14 years after operation. One patient died 2 years after operation of causes unrelated to the thyroid and without evidence of recurrence. In contrast to these excellent results, all 14 of the patients with undifferentiated carcinomas and sarcomas either are dead of their disease or had experienced

hopeless recurrences when last seen. This experience emphasizes the futility of our methods of treating the highly malignant tumors of the thyroid and suggests that efforts be intensified in attacking tumors of low malignancy in order to reduce the death rate.

Treatment of Discrete Adenomas of the Thyroid

The highly malignant tumors of the thyroid grow with great rapidity, cause distress within a few months of the time they are first noted and almost without exception are diagnosed clinically before operation. Despite the fact that the majority of these patients are operated upon within 3 months of the time the tumor was first noticed, the majority are hopelessly inoperable and all have proved to be incurable.

Despite the fact that most patients with low grade (papillary) carcinomas delay operation for 1 to 10 (averaging 5) years¹ from the time the tumor is first noticed, the results of carefully planned conservative surgical procedures have been excellent. The prognosis in these cases appears to be more closely related to the type of operation performed than to the duration of the disease.

Since many of these low grade cancers enlarge slowly or not at all, they are apt to be confused with benign adenomas. A fairly high percentage of all firm, solitary tumors of the thyroid, especially in young people, prove to be carcinomas, and for this reason suspicious nodules of the thyroid should be removed completely, preferably by total lobectomy, so that secondary operations, x-ray therapy and radioactive iodine will not be required. At the time of the thyroid operation, the retrothyroid area, the midline, the superior mediastinum and the lower part of the carotid sheath should be explored for metastases. If none are felt it is not necessary to do a prophylactic dissection, but if nodes are palpable the involved groups should be removed completely with their surrounding envelope of fatty and areolar tissue. The patient should then be followed closely for at least 5 years, and if any further nodules develop these should be removed.

Our failure to cure the highly malignant cancers by any means now at our disposal, and the fact that 80 per cent of these highly malignant cancers arise in patients who were not aware of any pre-existing abnormality of the thyroid,¹ force us to adopt, for the present, a pessimistic attitude toward this type of carcinoma. However there is little excuse for a high incidence of recurrence of the low grade cancers, almost all of which are curable by an adequate primary operation.

If all operations for discrete adenomas of the thyroid were performed in such a way that an existing carcinoma might be cured, there would be fewer recurrences of low grade cancers and the mortality rate of carcinoma of the thyroid would be lowered significantly.

Summary

1. Radioactive iodine is least effective in the undifferentiated and highly malignant types of carcinoma of the thyroid in which it is most needed.

CARCINOMA OF THYROID

2. Radioactive iodine is most effective in well differentiated, colloid forming carcinomas of low malignancy, the majority of which are amenable to cure by surgical removal.

3. The usefulness of I^{131} in the treatment of carcinoma of the thyroid is limited to the small group of carcinomas of low malignancy which have metastasized or extended beyond the scope of surgical removal.

4. Roentgen therapy is of little value in the well differentiated carcinomas of low malignancy and should not be given prophylactically to prevent the recurrence of tumors which apparently have been excised completely.

5. In undifferentiated cancers of high malignancy neither operation nor treatment with radioactive iodine are of much value. Although not often effective, roentgen therapy should be given a trial.

6. Even the most radical operations performed within a few weeks or months of the onset of undifferentiated carcinomas of the thyroid have failed consistently to effect cures.

7. Papillary carcinomas which are of a low order of malignancy and which, fortunately, are the most common type of carcinoma of the thyroid, are almost always amenable to surgical cure provided the initial operation on the thyroid is thorough and complete.

8. Since it is clinically impossible to distinguish between a benign, solitary adenoma and a low grade carcinoma of the thyroid, discrete adenomas should be removed completely by excising the entire lobe on the affected side.

9. Thorough and complete removal of thyroid carcinomas and their regional metastases is the safest and most dependable treatment now available.

10. Inoperable recurrences or metastases of well differentiated, colloid-forming cancers of the thyroid may be amenable to control by I^{131} .

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CHYLOTHORAX

A Conservative Method of Management

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Department of Thoracic Surgery

CHYLOTHORAX is produced by interruption of the thoracic duct above the aortic hiatus with fistulous communication into a thoracic space. Such a condition is serious and will prove fatal in a high percentage of cases unless adequate treatment is instituted. A review of medical literature suggests considerable variation in opinion as to clinical management of this complication.

Etiology: Chylothorax is usually produced by direct trauma to the thoracic duct. Until recently the chief offenders have been penetrating wounds inflicted by bullet, steel fragment or knife. Fractures of the vertebral column and severe compression injuries of the thorax have resulted in interruption of the duct. Neoplasms involving the posterior mediastinum may be capable of producing chylothorax; care must be taken, however, to distinguish between chyle and a chyloform effusion. In recent years an increasing number of surgical procedures have been employed involving the posterior mediastinum; splachnicectomy, esophagectomy and mediastinotomy in vascular surgery have become commonplace. Surgical injuries to the thoracic duct in these procedures are now recognized as the principal cause of chylothorax.

Anatomy: (Figure 1) The thoracic duct arises from the cisterna chyli at the level of the second lumbar vertebra and enters the posterior mediastinum through the aortic hiatus. The structure rests on the anterior surface of the vertebral column, usually to the right of the midline, and is intimate with the azygos vein and splanchnic nerves. Whereas variations of the thoracic duct are common, the structure usually consists of a single trunk with paired intercostal branches capable of becoming collaterals. Characteristically the duct crosses to the left at the level of the sixth thoracic vertebra and, passing under the arch of the aorta, ascends with the esophagus into the first rib circle. In the neck the duct arches above the level of the clavicle and joins the subclavian vein near its junction with the internal jugular vein.

Physiology: The flow rate of chyle is directly dependent on diet and fluid intake. The usual quantitative value varies between 60 cc. and 200 cc. per hour.¹ Total chyle output in adults usually exceeds 2.0 liters per day.¹ The pressure within the duct has been measured in dogs and has been found to reach 15.0 cm. of water.² The specific gravity usually is from 1.012 to 1.020. The fluid is alkaline in reaction.

The chemical constituents of chyle are those of lymph fluid with added fat. About 60 to 70 per cent of ingested fat is carried in the chyle; the quantitative value varies between 0.5 to 3.0 Gm. per cent depending on the diet. Chyle

CHYLOTHORAX

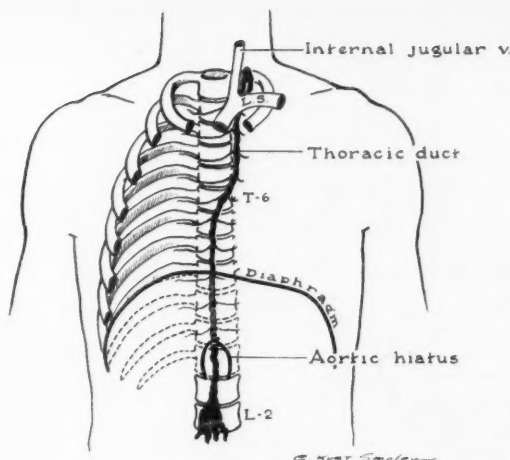


FIG. 1. Diagram illustrating the pathway of chyle.

also contains large amounts of protein; protein levels range from 1.0 Gm. to 6.0 Gm. per cent with an average level of 3.4 Gm. per cent. The nonprotein nitrogen, sugar and electrolyte levels are similar to the accompanying blood values; the lymphocyte and eosinophil counts in chyle are considerably higher than in circulating blood.²

Symptoms: Chylothorax may occur within a few hours following injury or an operative procedure. As a surgical complication, the chylous effusion may not appear for a period of a few days to a week. This latent period suggests that the duct was not initially severed at the time of surgery but that the fistula was secondary to impaired blood supply and local ischemic necrosis.

Regardless of the cause at the time of onset, chylothorax manifests itself by two serious disturbances in physiology: (a) asphyxia, and (b) inanition. In the former, the symptoms are identical to those of a massive hydrothorax producing mediastinal compression and shift. The symptoms of air hunger, anxiety, tachycardia, diaphoresis and pallor are related directly to the cardio-respiratory embarrassment produced by the fluid mass. Continuous loss of chyle over a period of days or weeks results in severe depletion of fat, protein, water and electrolytes. Unless the replacement of these nutritional elements exceeds the loss, a severe deficiency state develops. The symptoms of hunger, thirst and muscular weakness are indicative of physical deterioration and inadequate therapy.

Case Report

A 14 month old white girl weighing 24 pounds was admitted to the Cleveland Clinic Hospital for diagnosis and therapy. According to the parents, the child suffered

repeated episodes of regurgitation when feeding and recurrent pulmonary infection associated with aspiration of food. Studies by Dr. F. Mason Sones in the Department of Cardiology included retrograde aortography. Doctor Sones established the diagnosis of dysphagia lusoria with a retro-esophageal right subclavian artery arising from the left descending aorta.

On May 16, 1951, a left thoracotomy was performed and mediastinal dissection of the aorta and its major branches carried out. As assumed by Doctor Sones, the right subclavian artery originated in the posterior descending aorta, and passed between the esophagus and vertebral body to enter the right thorax. The vessel was isolated and divided between ligatures. During the course of the dissection, the thoracic duct was visualized and precautions were taken to avoid injuring the structure. There was no discernible injury and no escape of chylous fluid (fig. 2).

The immediate postoperative condition was satisfactory; however, on the fifth postoperative day an abrupt change occurred in the patient's condition. The diagnosis of left hydrothorax was made. Postoperative films prior to the fifth postoperative day showed no evidence of fluid in the left thorax. Aspiration revealed pure chyle in the left thorax; approximately 300 cc. was removed. The patient was placed on oral starvation; however, the chyle re-formed at the rate of approximately 400 cc. per day. Careful measurement of the fluid intake was made and adequate intravenous replacement instituted.

On May 26, 1951, a Foley bag catheter was inserted under local anesthesia and connected to water-seal suction. At the same time the patient was placed on skimmed milk feedings, as obliteration of the peripheral veins from the continuous intravenous feedings made this change mandatory. Free drainage of the chyle permitted re-expansion of the left lung and the daily total volume of fluid was easily measured. Average total volume per 24 hours for the first 3 days following institution of the continuous suction drainage was 798 cc. The character of the fluid was typical of chyle although an undetermined amount of pleural fluid was undoubtedly present. Approximately 4 days after closed suction, or 8 days after the discovery of the hydrothorax, the daily total output reduced to 510 cc. On May 31, 1951, a total output from the chest was 420 cc. and following this date there was a rapid diminution in the chyle flow. On June 4, 1951, approximately 12 days after the onset of the chylothorax, there was only 40 cc. of chyle delivered to the tube. The tube was then alternately clamped and opened every hour without change in the patient's general condition. Radiographic films showed complete expansion of the left lung and it was believed that pleural symphysis had occurred. The tube was then clamped for 36 hours with no observable change and removed on June 6, 1951.

While significant chemical changes were observed during this entire period, the patient did not suffer appreciable weight loss nor did clinical dehydration occur at any time. The child has been seen on repeated occasions and appears to have recovered completely without residual.

Discussion of Therapy

Treatment of chylothorax has included surgical ligation of the severed thoracic duct,^{1,3} multiple thoracenteses with intravenous injection of the aspirated chyle,⁴ oral starvation and periodic needle aspiration. In 1938, the literature revealed a mortality rate of 50 per cent in patients with chylothorax. The cause of death is usually attributable to the effects of dehydration and inanition.

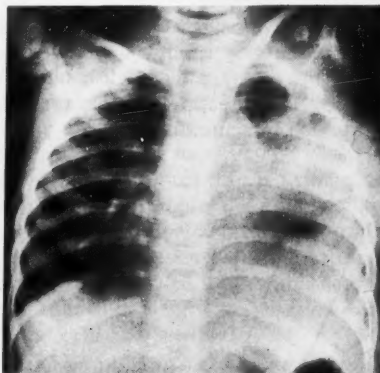
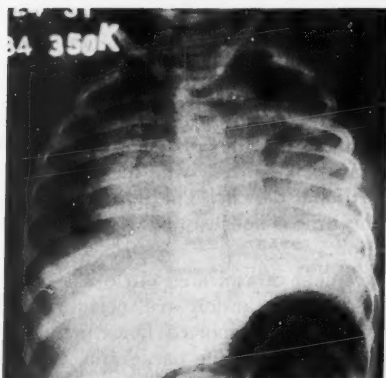


FIG. 2
200 cc.
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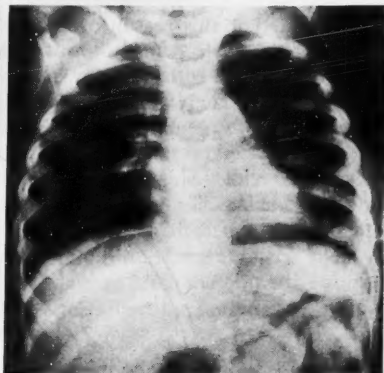
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CHYLOTHORAX

(a)



(b)



(c)

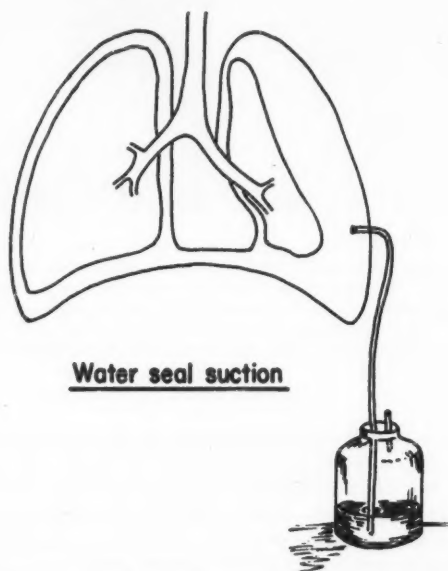
FIG. 2. (a) Radiographic appearance of severe pneumochylothorax after initial aspiration of 200 cc. of chyle. Note deviation of mediastinum to the right and obliteration of all lung markings on the operative side. (b) Roentgenogram made following institution of closed suction drainage by Foley bag catheter and water seal. (c) Final roentgenogram made one month after discharge from the hospital. There is minimal residual pleural thickening on the left.

The direct approach of surgical ligation has the advantage of being definitive; closure of the chyle fistula is obviously desirable. However, the disadvantages should not be overlooked. Exploration of the mediastinum under general anesthesia is a serious undertaking in this type of patient. Likewise, the problem of finding the chyle leak may be difficult; anatomic variations plus depositions of fibrin and clot may be factors which seriously handicap the surgeon. Possibly extensive mediastinal dissection with unsuccessful closure may convert the chylothorax into a bilateral process. Although indications

differ with the experience and ability of the individual surgeon, the diagnosis of chylothorax does not necessitate immediate surgical intervention.

Aspiration of chyle by thoracentesis is diagnostic and therapeutic. Relief of pressure produced by extensive chylothorax will prevent mediastinal compression and its accompanying serious cardiorespiratory disturbances. However, aspiration alone may be only a temporizing procedure since it can do little to retard re-formation of the intrapleural chyle. Actually tremendous quantities of chyle may be removed over the period of a week resulting in serious fluid and nutritional deficits. The hope of spontaneous closure of the chyle fistula during this time is not justified when the patient's condition shows progressive deterioration.

Intravenous replacement of aspirated chyle has been advocated as a supportive measure.⁴ As might be anticipated, certain hazards may be encountered. Sudden death has been reported following the infusion of aspirated chyle.⁵ As mentioned in the preceding paragraph, this course of management, coupled with aspiration, is predicated in anticipation of spontaneous closure of the fistula. For this reason oral starvation has been suggested as a means of reducing the chyle volume flow. While this apparently is not a definitive procedure, it is said to have been successful when employed by English surgeons in World War II. It appears, however, to be a forceful approach to a problem characterized by inanition; not unlike purgation in acute diarrhea.



Water seal suction

FIG. 3. Diagram of simple principle of water-seal suction drainage. Any form of intercostal catheter may be employed; the Foley bag catheter has been most successful in our experience.

Any treatment of chylothorax, both conservative (nonsurgical) and definitive, would have obvious advantages. A method employing closed suction drainage with supportive therapy has been used once, successfully, and is reported herein. Although conclusions cannot be drawn on the basis of one case, the rationale may be of interest. Since chylothorax is a rare complication, clinical impressions must be obtained without benefit of case series.

Chyle is an alkaline fluid and peculiarly resistant to bacteria; empyema has not been reported as an added complication. Chyle also is an irritant to the pleura and excites a fibrinous exudate over the uninvolved surface. Whereas a needle aspiration removes a part or most of the chyle, it is impossible to obtain the entire volume. Continuous suction drainage can evacuate the fluid as rapidly as it forms; more important, it permits continuous expansion of the lung allowing approximation of the visceral and parietal pleura. Obliterative pleuritis may rapidly produce a firm symphysis between the lung and chest wall. When this occurs the pressure potential of the chyle is less than that required to re-collapse the lung, i. e. continuous expansion of the lung with resultant pleural symphysis may act as a physiologic tampon in the chyle fistula.

The method of establishing a closed catheter drainage is simple. Under local anesthesia a stab wound incision is made, usually at the suspected level of the fistula in the posterior axillary line. A Foley bag catheter is inserted and connected by tubing to a water-seal suction jar (fig. 3). The amount of sterile water in the jar is measured carefully and the daily output is charted. Machine suction on the water trap is neither necessary nor desirable. Since the danger of empyema is remote, the tube may be left in place for considerable time. The degree of expansion or pressure of undrawn fluid may be determined by roentgenograms at intervals. If expansion is prompt and maintained, pleural symphysis should be well established within a week. After that time the status of fistula and pleural obliteration can be determined by periodic clamping of the tube.

In addition to the closed drainage, the nutritional requirements of the patient must be met. Emphasis on fluid and electrolyte balance is obvious; the need for protein supplement is likewise apparent. Employment of oral and parenteral routes of feeding will depend on the individual case; both procedures may be necessary.

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THE MANAGEMENT OF THE PATIENT WITH THE PERMANENT COLOSTOMY

R. B. TURNBULL, JR., M.D. and ARTHUR G. MICHELS, M.D.*

Department of Surgery

THE term colostomy, or artificial anus, is of ominous significance to the patient. However, it is interesting to follow the change in his attitude from doubt and depression, through increasing confidence, and finally to personal pride in his ability to manage the artificial opening. As he begins to realize that he can actually lead a normal life despite his handicap, depression is replaced by planning for the future.

Many physicians who refer patients ultimately requiring colostomy see only a few such cases in the ordinary practice of medicine and as a result have little experience in its management. Since these same patients will return with many of their problems to the referring physician, we feel that our experience in dealing with such problems might well be described.

In the past 5 years we have had the opportunity to instruct and follow 500 patients with permanent colostomies."¹

Initial Contact

Most patients with carcinoma of the rectum are somewhat aware of their plight before they are seen at the Clinic. The referring physician has made a digital examination in most cases and referred the patient for biopsy and treatment. Information regarding the diagnosis may have been passed directly or inferred. In either case, the patient is worried and in great fear. Unfortunately, it seems that most of them have been acquainted with or know of some person who has had a palliative colostomy; therefore they have a preconceived idea of their future which may be unjustified.

As soon as the biopsy specimen has been taken and proctoscopic examination has been completed, the average patient expects a definite answer to his questions. If an ulcerating carcinoma has been found, *frankness and truth* are appreciated by the patient and his family. Except in rare instances, most persons accept the diagnosis with little demonstration of emotion. A quiet, positive answer is generally appreciated. In the case of a large papillary lesion that may be benign, the patient may be so informed. Reassurance is necessary at this point. Under no circumstances should a positive diagnosis of cancer be given when there is doubt.

The reaction to the diagnosis of "cancer of the rectum" is a flood of questions such as, "Will I have an artificial opening?" "How will I live?" The guilt complex is illustrated by, "What have I done to deserve this?" or, "I have

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always led a good life, why has this happened to me?" The public's "hopelessness of cancer" attitude is illustrated by such remarks as, "Nothing can be done for cancer," and "I suppose I'll just be opened up and closed again."

At this point, it is an unusual person who is ready to assimilate any information about a colostomy or the details of operation. Therefore the less said about the future in this respect the better.

The surgeon should attempt to do most of the talking, mainly because the patients' questions are unanswerable. The necessity for colostomy is stressed but questions pertaining to its management must be postponed and the patient assured that an educational program pertaining to its care will be instituted before he leaves the hospital. The only decision the patient must make is whether or not he will submit to radical surgery. Admittedly, a colostomy is a chore and an inconvenience. It is not as satisfactory as a normally functioning rectum but it is a more than satisfactory trade for cancer. One can learn to live with a colostomy but not with a cancer. When deluged with questions regarding curability, colostomy management, and operative procedure, one can counter with asking the patient whether or not he will choose a surgical approach. With this point agreed upon, the surgeon can avoid further questioning by stating that many patients experience excellent results, all inquiries will be answered during hospitalization, and that adequate management of the colostomy may be obtained soon after operation. No promises can be made as to the "cure." The patient must be reminded that a cancer is a cancer and neither makes rules nor obeys them. Certain gross predictions may be made on pathologic considerations; however, these are not available until after operation is completed.

To withhold information about a cancer from a patient who wants it is to start an elaborate amateur "cat and mouse" production. The patient realizes he is not well and will frequently go from one doctor to another to have his illness diagnosed. He begins to distrust both family and physician and, in the end, there is bitter resentment from all sides.

Hospital Management

The newly made colostomy will function better if left to its own devices. Diarrhea or frequent bowel movements are undesirable and break down the patient's morale. Cathartics in any form are contraindicated. The ideal situation is a daily spontaneous movement that is dry and formed. Toward this end we have initiated a "colostomy diet." This consists of a nourishing regimen which omits gas and diarrhea producing foods. Although there is great individual variation in this respect, certain foods may be eliminated from the first. In general, fruits (cooked or raw) are omitted. Uncooked vegetables (salads) often cause diarrhea. Milk and other dairy products should be encouraged because of their constipating effect. Each patient is asked to list foods that formerly caused gas or frequent bowel movements, and to avoid them. Among the undesirable foods are the following: raw salads, tomatoes, string

PARTS OF COLOSTOMY IRRIGATION SET

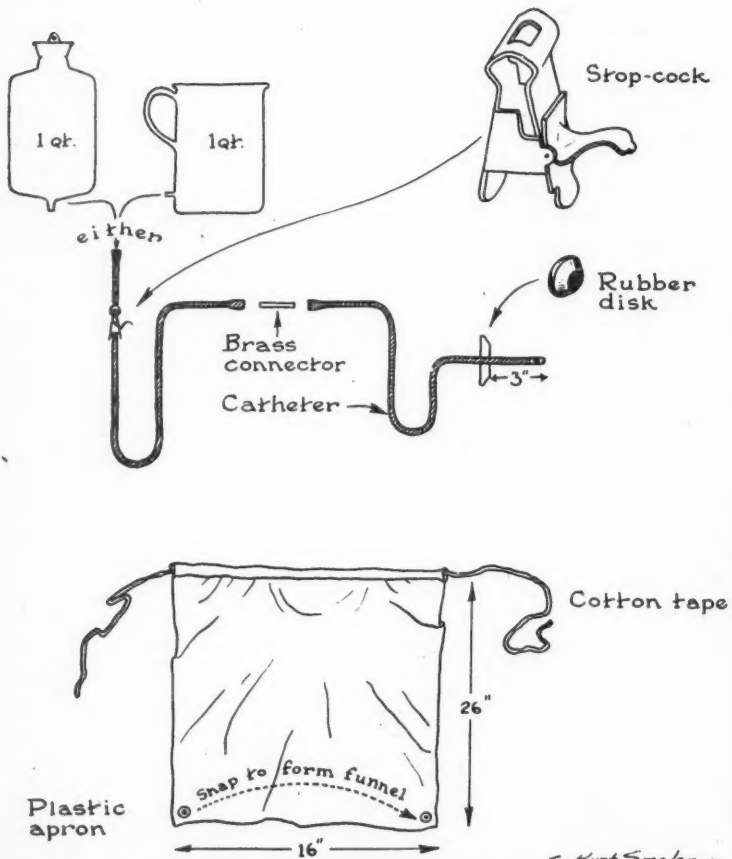


Figure 1

beans, baked beans, peas, lima beans, apples, tough celery, cabbage. It is important to adhere strictly to the "colostomy diet" for a few weeks. This period is the most critical for the patient because, if he finds that he has some control over his colon, he will make a rapid adjustment. The fear that all colostomy patients have is that it will "run all over" when they are away from the protection of their homes. Although some never have this happen, they still avoid social contacts for long periods. The foundation for this attitude is

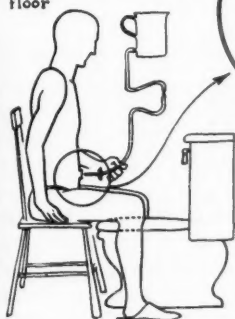
PERMANENT COLOSTOMY

A METHOD OF COLOSTOMY IRRIGATION

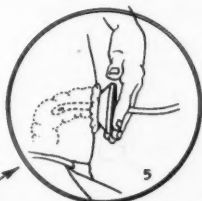
FASTENING APRON IN PLACE 1,2,3.



Container hung approx. 5 ft. above floor



4 Placing catheter into colostomy opening



5 Catheter in place



6 Running water into colostomy from irrigation container filling the colon. Colon contents can then empty into commode after removal of catheter.

Figure 2

laid in the first few colostomy movements and for this reason the first week to 10 days following surgery are the most important.

Besides a dry, constipating diet, some agent is desirable to reduce the odor of gas and stool. The chlorophyl compounds have been of great value and two products in particular, Chloresium* and Olodex** have been most useful. Beginning the second postoperative day, one tablet is taken with each meal and if tolerated the dose is doubled. There have been no evident side effects

*Rystan Co., Inc., New York, N. Y.

**Walker Vitamin Inc., Mt. Vernon, N. Y.

and the stool and gas are rendered almost odorless. Another product of great value is Kaophyl.* This capsule containing kaolin and chlorophyll is placed in the colostomy morning, noon and night and completely deodorizes gas. Although it is impractical to use these products continually, they are of value in the early weeks and on special occasions.

Colostomy Management

There are two kinds of "control" over normal bowel function: (1) sphincteric and rectal control (the sphincter and rectum acting as one unit), and (2) colon (reservoir) control. Since the rectum and sphincter are sacrificed, the patient must take advantage of the reservoir control that is already present. The left hemicolon acts as a storage and dehydrating space and takes from 24 to 48 hours to fill in the average adult. "Reservoir continence depends on the plastic adaption of the smooth muscle of the colon to the enlarging fecal mass. It is this type of continence which is retained by the patient with a well managed abdominal colostomy and its full utilization makes colostomy a well tolerated deformity."²

To prevent spontaneous colostomy evacuation, the patient must determine the time at which his colon is filled, and anticipate this by a thorough evacuation with a cleansing enema.

Most patients find colostomy irrigation is convenient and adequate at 48 hour intervals. A small group prefer daily enema evacuations. The important point is that the dressing does not become soiled between evacuations. Whether morning or evening irrigations are used depends on the convenience of the patient. We advise morning irrigation in most cases because this has been the most frequent preoperative bowel habit.

Older patients with bowel habits of clock-like regularity may follow this plan after operation. Some have spontaneous evacuations at 7 a.m. each day and remain dry and comfortable until the next day. This is to be encouraged, and care must be taken not to interfere with such regulated reservoir continence. The best plan is to determine the preoperative bowel habit of each patient and to try to match this with an appropriate irrigation pattern.

The amount of water to be used at each irrigation is remarkably constant. Generally one quart of warm water is allowed to run slowly into the colon. The water is not only a medium for the recovery of colon content but acts as a stimulus to mass peristalsis through overdistention of a hollow viscus. The irrigation is to be repeated as many times as necessary to evacuate the colon. Salt or soda may be added occasionally as both are known to stimulate peristalsis. Soap should be avoided as it is irritating to the mucosa.

Irrigating Equipment

Many types of apparatus have been invented for irrigating the colostomy. The accompanying diagrams show the simplest of these (fig. 1). There is so

*Warren-Teed Products Co., Columbus, Ohio.

much variation among patients that a standard set or method is not applicable in each case; however, the applied principles may be varied to suit individual needs. It must be explained to each patient that the equipment and method introduced while in the hospital is not necessarily inflexible. The apparatus may be either an enema syringe or can with attached tubing and rubber disk. Some women who travel prefer a "Sojourn" (douche) bag because it is easily packed. Of the commercial products, the John Greer colostomy compact* is effective, clean and adaptable to the needs of the colostomy patient. On the seventh or eighth postoperative day, a doctor visits the patient and presents the equipment shown in figure 2. Colostomy irrigation is explained simply as an enema to be taken at intervals. Reservoir continence is discussed and the accompanying diagrams interpreted. The patient is taken to the bathroom and instructed personally during the first two irrigations. Questions are answered as they arise. The importance of personal help at this critical period cannot be overestimated. It usually is not necessary that subsequent irrigating periods be supervised.

Technic of Irrigation

Morning hours suit most patients best. A position of comfort is necessary since the average time of irrigation is 45 minutes.

The plastic apron is fastened around the waist below the colostomy and acts as a funnel. The lubricated index finger should be inserted at full length into the colostomy to dilate it and to straighten out a kink usually present just inside the peritoneum. The catheter is inserted 3 or 4 inches with the water running and is moved in and out a number of times until the terminal 3 to 6 inches of colon are cleansed. Following this, one quart of water may be introduced slowly into the colon, the rubber disk acting as a dam to prevent reflux. A few minutes later the catheter may be withdrawn, allowing the escape of contents. The whole operation should be repeated as many times as necessary to evacuate the colon. Abdominal massage (from right to left) has been found helpful by many patients. Some complain of ejection of enema water 1 to 2 hours after irrigation. This is troublesome, wets the clothing and is embarrassing. It may be avoided by catheterizing the colostomy at the end of the irrigation period. The water is usually pooled in the lower colon within reach of the catheter. The following precaution should be observed: if irrigation is not properly completed and if the colon is left partly full, the remaining contents will be ejected at frequent intervals throughout the subsequent 48 hour period. Although such patients complain of diarrhea, they are in reality showing the effects of an incompletely evacuated colon. One patient states, "If, by chance, you should stop short of the complete cleansing, the result will be known during that day. Not only will any gas emitted be malodorous but you have small excretions late in the day. Conversely, if a thorough job has been done, any gas emitted will be odorless. Except for some occasional small accumulations of residue evident at bedtime, cleanliness endures for 48 hours. The routine requires just one hour every other morning."

*John Greer Co., Oakland, Calif.

Colostomy Dressing

The colostomy dressing may be simple (fig. 3). A common method is effectively described by a male patient: "For dress during the day an elastic abdominal supporter is worn. Under this (and over the colostomy) is a plastic refrigerator bowl cover containing 4 thicknesses of toilet paper and a 2½ inch square pad of cotton next to the colostomy. The toilet paper is a moisture absorbent. For night dressing I have wide unbleached cotton bands which my nurse made for me. A small piece of cotton is placed over the colostomy. This

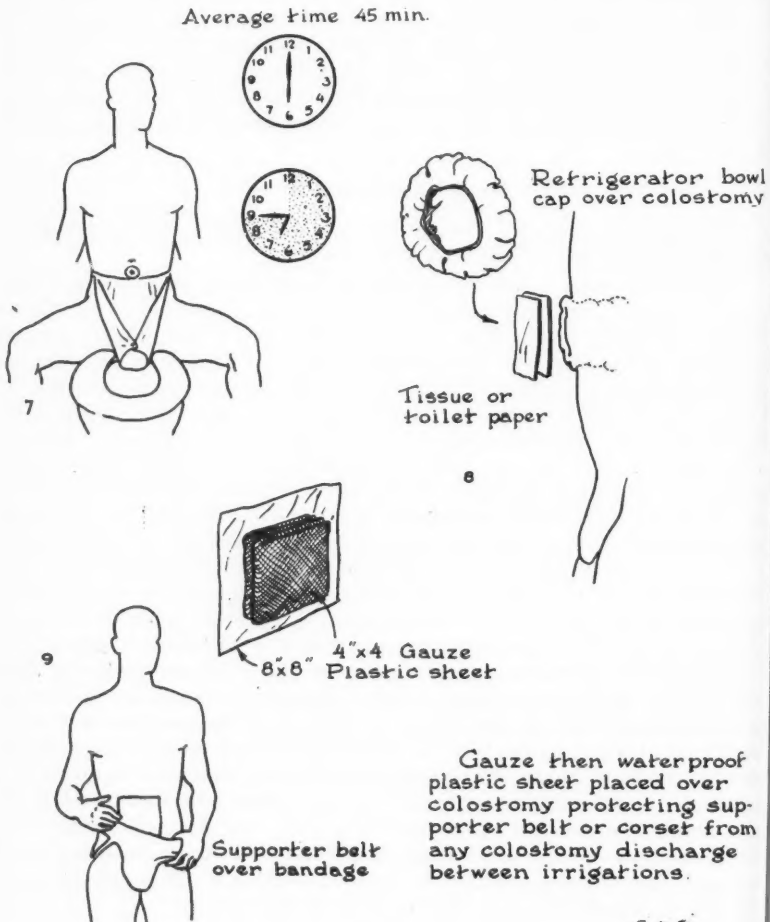


Figure 3

PERMANENT COLOSTOMY

is covered with folded toilet paper. Over this I place a sheet of towel paper, then the band. Usually, except for some moisture, the covering is still clean in the morning." For day wear most patients place Kleenex tissue over the colostomy, several gauze squares and an 8 x 8 inch square of pliofilm. Over this may be worn a wide elastic supporter belt. The B. U. B. supporter* is particularly well suited to the needs of most male patients.

In general women use the same colostomy dressing as men and a two way stretch girdle is pulled over all. Again, a pliofilm square is important as a protection against moisture from the colonic mucosa.

Colostomy Bags

The use of colostomy appliances is never encouraged. To wear a bag is to admit defeat in management. They are bulky and foul smelling in most instances. The odor of fecal contaminated rubber is penetrating and permanent. Ileostomy appliances that are cemented on the skin are not applicable to colostomy since a large amount of gas soon balloons the bag out. Moreover, solid stool cannot be let out of the bag through the valve. There is some evidence to show that colostomy bags encourage prolapse.

Conclusions

A well planned educational program for the patient with a permanent colostomy should be initiated in the immediate postoperative period. Dietary factors and colostomy irrigation technic have been presented. Such programs have proved of inestimable value in early rehabilitation.

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2. Gaston, E. A.: Physiology of fecal continence. *Surg., Gynec. and Obst.* **87**:280 (Sept.) 1948.

*Made by the John B. Flaherty Co., New York, N. Y.

THE LATERAL DECUBITUS POSITION IN CHOLECYSTOGRAPHY

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Department of Roentgenology

THE value of the lateral decubitus position during cholecystography has been long established. Its use as a routine procedure is recommended and can be accomplished with little additional effort, resulting in greater diagnostic accuracy.

For this view the patient is positioned on a mobile table, with his right side directly over a well in the table top. A horizontal x-ray beam is employed, traversing the gallbladder area in a posteroanterior direction. An upright Bucky holds the cassette in a position against the patient's right upper abdomen (fig. 1).

In our routine cholecystographic examination at the Cleveland Clinic, each patient has a posteroanterior lateral decubitus film and an ordinary posteroanterior prone film. These are developed and the wet films studied. If these two films are diagnostic, no other films are exposed. If, in the opinion of the roentgenologist, these two films do not constitute a diagnostic examination, fat meal, pitresen, or a second dose of dye are given, or oblique and up-

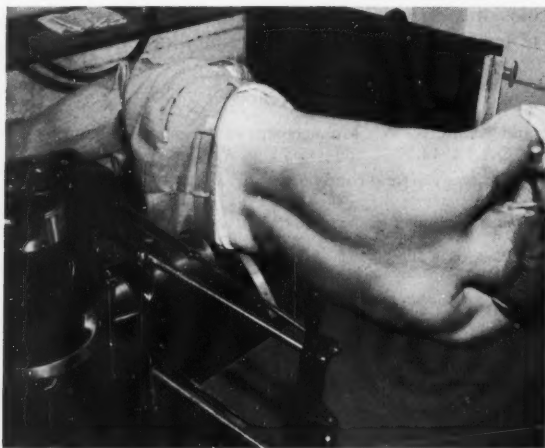


FIG. 1. Table used for lateral decubitus roentgenograms of the gallbladder. Note the well in table top which offers no obstruction to x-ray beam and which permits the patient's right flank to drop down slightly decreasing his anteroposterior diameter.

*Formerly on the Assistant Staff. Now practicing in Joliet, Ill.

**Former Fellow. Now located in Kingsport, Tenn.

LATERAL DECUBITUS POSITION IN CHOLECYSTOGRAPHY

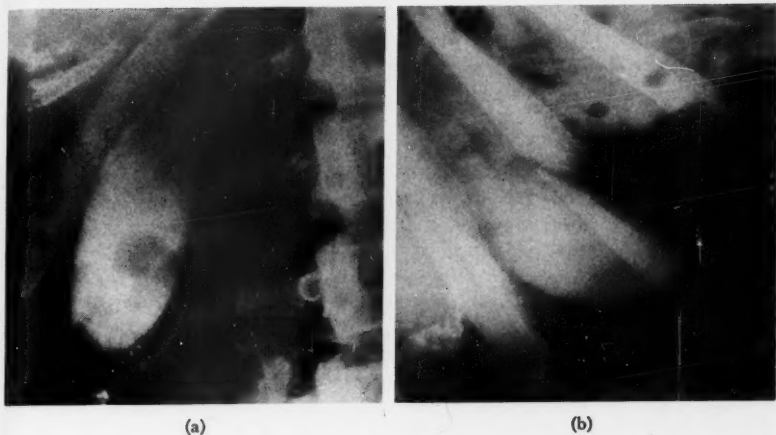


FIG. 2. Normal gallbladder. (a) Posteroanterior prone roentgenogram showing fundus of the gallbladder obscured by gas and fecal shadows in hepatic flexure of the colon. (b) Posteroanterior lateral decubitus roentgenogram revealing that gallbladder has dropped toward the right and now lies unobscured by gas.

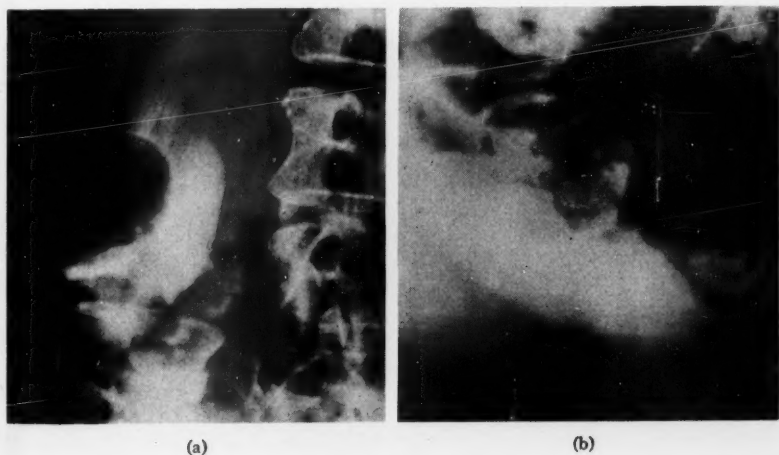


FIG. 3. Normal gallbladder. (a) Posteroanterior prone roentgenogram with gallbladder obscured by intestinal gas, fecal matter, and the right iliac crest. (b) Posteroanterior lateral decubitus roentgenogram showing a normal gallbladder lying unobscured in right flank.

right films may be taken. By following this procedure, less than 20 per cent of the patients need more than the two original films.

One of the main objections to routine prone views of the gallbladder is the great frequency with which the gallbladder shadow will be obscured by gas or fecal shadows present in the hepatic flexure of the colon, duodenal bulb or small intestine. These may be identified incorrectly as calculi or may obscure the presence of calculi in the portion of the gallbladder over which they are superimposed. Half cubic centimeter doses of pitressin will, in most instances, remove this obscuring gas and fecal matter; however its administration and subsequent repetition of the films are time consuming. More important, it is well known that pitressin is a dangerous drug and should not be prescribed to elderly patients suffering from hypertension or other types of cardiovascular disease. Compliance with these contraindications withholds the use of this drug from a large group of ill and elderly patients who have the greatest tendency toward gas accumulation. It is especially in this latter group that the lateral decubitus position is of great value. The gallbladder, if mobile, drops toward the right flank while the gas-filled bowel tends to float upward to the left giving an unobscured gallbladder shadow. Since the institution of the lateral decubitus film as part of our routine gallbladder examination, the administration of pitressin has been limited to an occasional young patient with obscuring gas present on both routine views. Formerly, pitressin was considered necessary in as many as 10 to 20 patients daily. The ability to obtain a gallbladder shadow free from obscuring gas on the decubitus film is demonstrated clearly in figures 2, 3 and 4.

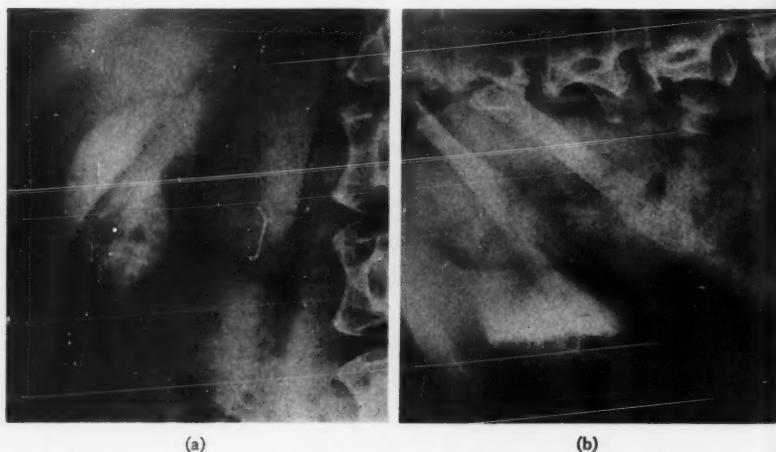


FIG. 4. Cholelithiasis. (a) Posteroanterior prone roentgenogram showing multiple nonopaque calculi. (b) Posteroanterior lateral decubitus roentgenogram where calculi have settled to bottom of the gallbladder silhouette. Note increased contrast between calculi and dye-containing bile above.

LATERAL DECUBITUS POSITION IN CHOLECYSTOGRAPHY

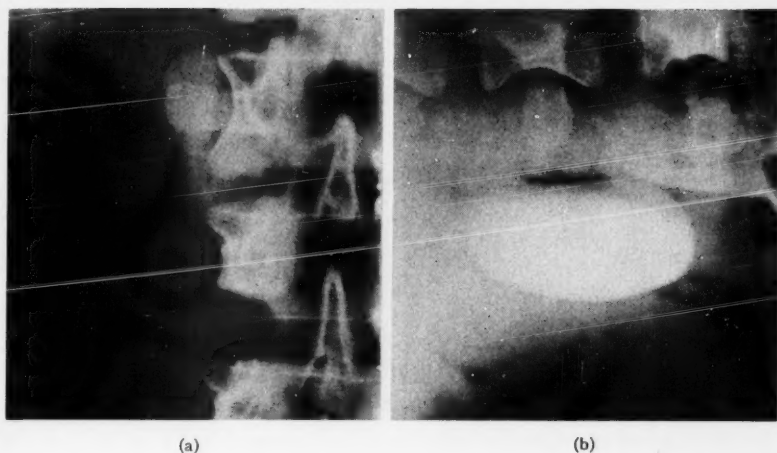


FIG. 5. Normal gallbladder. (a) Posteroanterior prone roentgenogram with gallbladder overlying the spine. (b) Posteroanterior lateral decubitus roentgenogram showing a normal unobscured gallbladder shadow down and to the right of spine. Note layer of bile of lighter specific gravity and less dye-density at top of the gallbladder shadow.

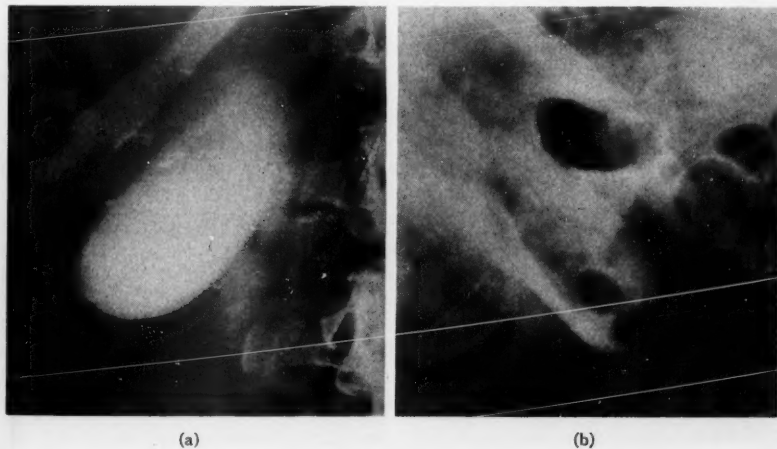


FIG. 6. Normal gallbladder. (a) Posteroanterior prone roentgenogram; normal gallbladder unobscured. (b) Posteroanterior lateral decubitus roentgenogram where obscuring colon gas has shifted over gallbladder.

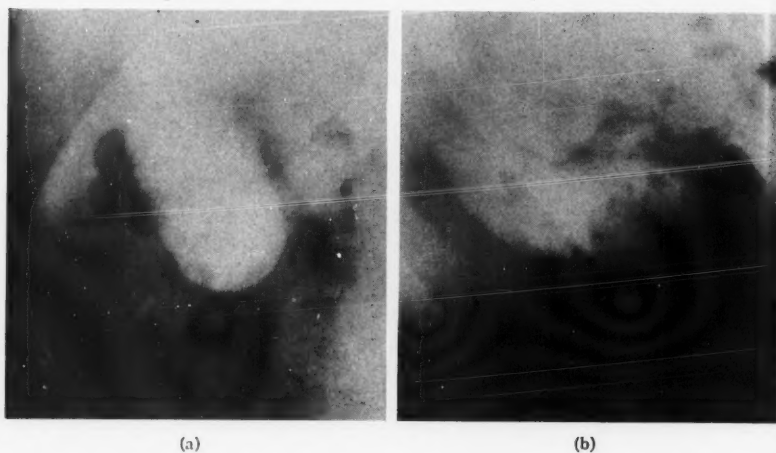


FIG. 7. Cholelithiasis. (a) Posteroanterior prone roentgenogram. Although calculi are present they cannot be distinguished from the superimposed gas shadows. (b) Posteroanterior lateral decubitus roentgenogram showing multiple small nonopaque calculi which have settled to bottom of gallbladder silhouette and stand out in sharp contrast to surrounding bile above although the obscuring gas still lies over gallbladder.

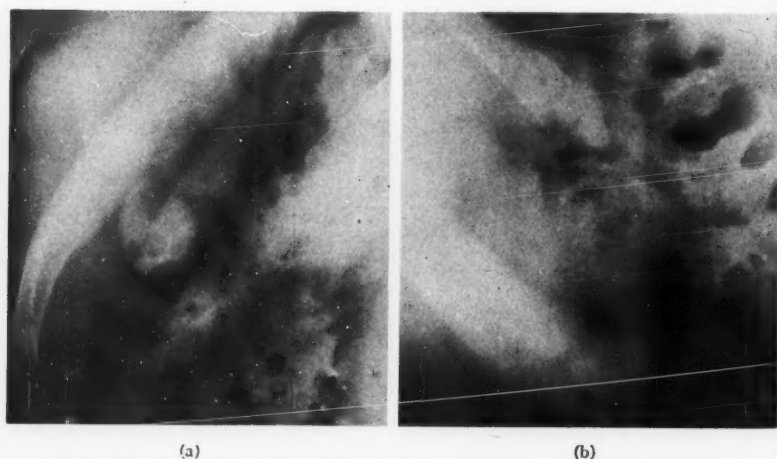


FIG. 8. Cholelithiasis. (a) Posteroanterior prone roentgenogram showing four nonopaque calculi simulating small gas bubbles. (b) Posteroanterior lateral decubitus roentgenogram where stones have settled to the bottom of gallbladder shadow.

In the occasional patient in whom the gallbladder normally overlies the spine on the routine posteroanterior prone view, the lateral decubitus film will show it to have fallen away from the spine and to be lying in an area unobscured by bony structures (fig. 5). In rare instances, the lateral decubitus film may show more obscuring shadows than the prone film but this occurs infrequently (fig. 6).

The various physiologic and pathologic contents of the gallbladder always occupy a level dependent on their relative specific gravities. On lateral decubitus or upright films, these contents are viewed in profile. Calculi, usually being the heaviest, often settle to the bottom of the gallbladder silhouette on these views (figs. 4, 7, 8 and 9). If concentrated bile is present the calculi may not settle to the bottom but instead may layer in a level of bile of the same specific gravity (fig. 10). Gallbladders free of calculi may demonstrate a normal layering of bile of various specific gravities (figs. 5 and 11).

If the gallbladder concentrates the dye well, small calculi may not be detected through the density of the gallbladder shadow on prone films. If, however, they settle on the lateral decubitus film they may be detected because they now occupy a peripheral portion of the shadow where the dye is less dense and where their shadow will be more apparent because the roentgen beam is passing through several of the stones layered into a thin but broad area (figs. 4, 7 and 9).

Solitary or multiple papillomata are easily mistaken for calculi on posteroanterior prone films; however, if lateral decubitus or upright films are made, these shadows maintain a constant position in relationship to the gallbladder shadow and fail to settle or layer in spite of the patient's position. This will often make their correct identification possible (fig. 12).

The upright film with the patient erect and employing a horizontal beam will, like the lateral decubitus position, demonstrate settling and layering of calculi, show the failure of papilloma shadows to change position, and will on occasion free the gallbladder shadow of obscuring gas. As a routine procedure, we have not found this position as valuable as the lateral decubitus since the gallbladder will drop into the lower abdomen, often to be obscured by other gas shadows or, in elderly people, by the osseous structures of the pelvis. In addition, when the patient is erect, the lower abdomen is slightly thicker and more surrounding tissue must be penetrated by the exposing roentgen beam, lessening detail and contrast. In the lateral decubitus position, the gallbladder falls into the flank area where the patient's anteroposterior diameter is actually less and contrast and detail are resultingly enhanced.

The routine use of the lateral decubitus position is recommended. The decreased need for pitressin and fat meals, the confirmation of cholelithiasis where evidence is only suspected on prone films, the correct identification of a papilloma or of calculi not indicated on prone films, and the actual saving of film and time will more than repay the user for its institution.

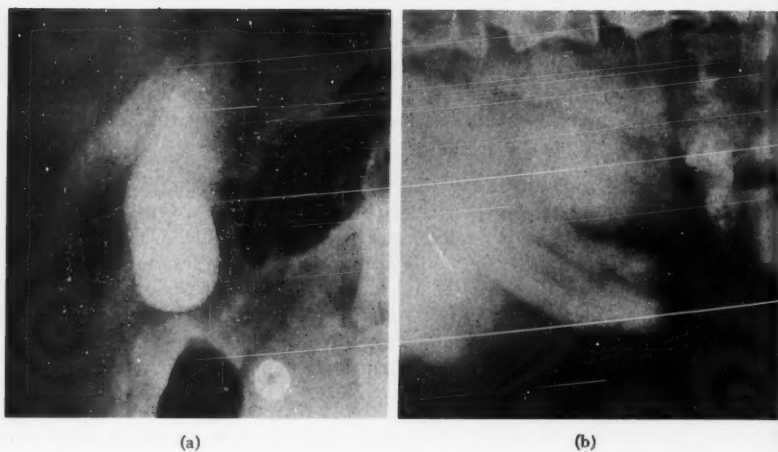


FIG. 9. Cholelithiasis. (a) Posteroanterior prone roentgenogram showing what appears to be a normal gallbladder free of calculi. (b) Posteroanterior lateral decubitus roentgenogram revealing that a few nonopaque calculi have settled to the bottom.

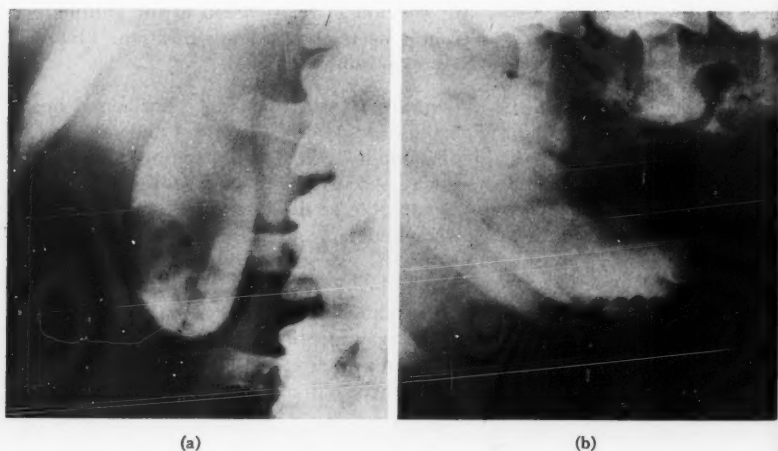


FIG. 10. Cholelithiasis. (a) Posteroanterior prone roentgenogram showing several obvious nonopaque calculi. (b) Posteroanterior lateral decubitus roentgenogram where "layering" of calculi is demonstrated.

LATERAL DECUBITUS POSITION IN CHOLECYSTOGRAPHY

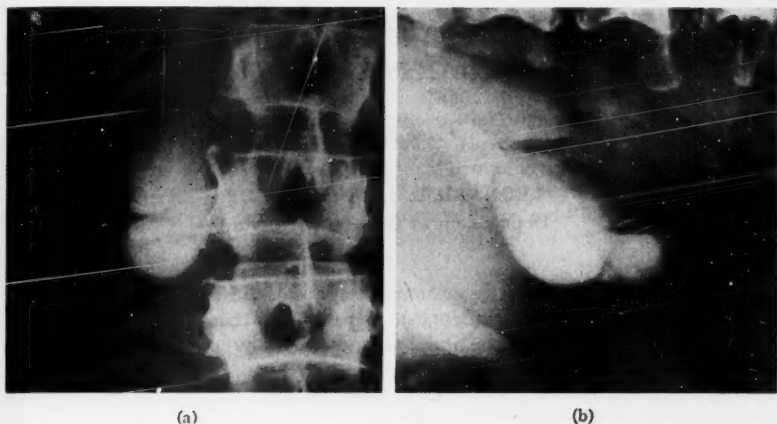


FIG. 11. Normal gallbladder. (a) Posteroanterior prone roentgenogram showing normal gallbladder. (b) Posteroanterior lateral decubitus roentgenogram where a layer of bile with low specific gravity and only slight dye-density is trapped in the top of a Phrygian cap.

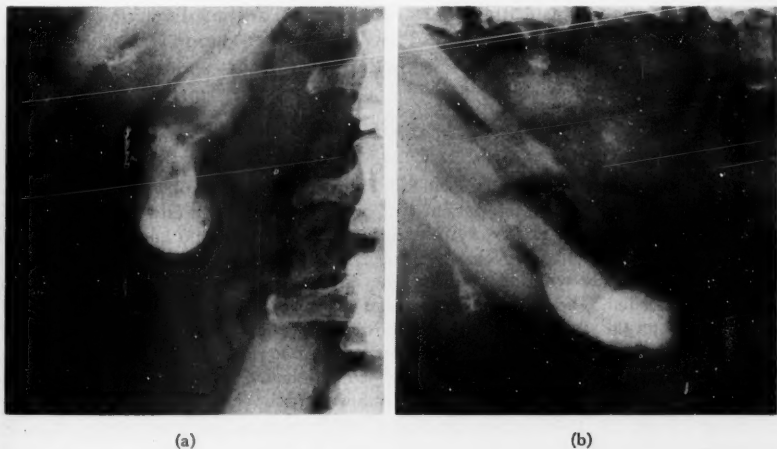


FIG. 12. Multiple papillomata. (a) Posteroanterior prone roentgenogram showing multiple nonopaque shadows. (b) Posteroanterior lateral decubitus roentgenogram. The nonopaque shadows have not settled or layered but remain in the same constant position with respect to gallbladder as in (a).

ASSOCIATION OF ACQUIRED HEMOLYTIC ANEMIA WITH PERIARTERITIS NODOSA

Case Report

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Department of General Medicine

ALTHOUGH the cause of periarteritis nodosa is still essentially unknown, there is considerable evidence to support the theory of Rich¹ that the disease is a manifestation of the anaphylactic type of hypersensitivity to various antigens. Acquired hemolytic anemia, in some cases, appears to be related to a hypersensitivity reaction with the production of auto-antibodies. It is somewhat surprising, therefore, that until very recently no report associating the two diseases has appeared in the medical literature.

Dameshek and Rosenthal² recently reported the association of periarteritis nodosa and acquired hemolytic anemia in 2 patients, both of whom showed remission with ACTH therapy. They also mentioned 4 cases of hemolytic anemia unaffected by splenectomy, in which a generalized and pronounced polyarteritis was found on postmortem examination.

The following case report represents another instance of associated hemolytic anemia and periarteritis nodosa. It is unique in that the acquired hemolytic anemia apparently subsided and was followed, 18 months later, by thrombocytopenic purpura and acute fulminating periarteritis nodosa.

Case Report

A married white woman, 26 years of age, was first seen on January 12, 1946 with a complaint of progressive weakness of 6 weeks' duration. It was obvious that she was severely anemic. Previously the patient had been in good health and worked steadily as a waitress. There was no history of excessive blood loss and no known exposure to hematopoietic toxins. The red blood cells numbered 700,000 per cu. mm; the hemoglobin was 3 Gm. The white blood cell count, differential, fragility studies, and platelet count were normal. The reticulocytes numbered less than one per cent. Bone marrow obtained by sternal aspiration was nondiagnostic. The icterus index was 20. The patient at this time was not hospitalized in our institution, but was seen in consultation by a member of our staff. The impression was "primary hemolytic anemia going into the aplastic stage." Multiple transfusions were administered.

From March 29, 1946 to November 4, 1947 the patient was seen at the Clinic at approximately 2 month intervals. Complete blood studies were done on each visit. There was a rather severe macrocytic anemia which gradually improved. The red blood cell count during this period rose from 1,880,000 per cu. mm. of blood to 3,080,000 with a rise in hemoglobin from 6.2 to 11 Gm. The volume index remained high, varying from 1.13 to 1.29. Intensive liver therapy caused no dramatic change. By March 1947 she felt well enough to resume her occupation despite a red blood cell count of 2,400,000

per cu. mm. and a hemoglobin level of 8 Gm. Because of her sense of well-being, the patient discontinued periodic check-ups after November 1947 and apparently remained in good health for more than a year and a half.

The patient next presented herself at the Clinic on July 5, 1949 complaining of black and blue spots on the feet and legs of one month's duration. During this period she had noted that she did not feel "up to par." Three weeks prior to admission she had suffered several bouts of cramping abdominal pain; one of the attacks was followed by the passage of several soft black stools. For one week she had experienced intermittent episodes of coldness, pallor, and numbness of the right index finger. Physical examination was essentially negative except for the presence of fading ecchymotic areas over both feet and legs.

Laboratory studies revealed no evidence of the previous anemia. The red blood cells numbered 4,460,000 per cu. mm.; hemoglobin 13 Gm.; blood cell volume 42 cc. per 100 cc. The volume index was 1.00, color index .90, and icterus index 4. The platelet count was 120,000, coagulation time (Lee and White) 8 minutes, bleeding time (Ivy) 7½ minutes, and prothrombin time 14 seconds (average normal value 14 seconds). Microscopic study of the bone marrow obtained by sternal aspiration was essentially normal except for the presence of an increased number of megakaryocytes and a decreased number of platelets. The white blood cell count was 8100 with a normal differential count. There were 3 per cent eosinophiles. The sedimentation rate was definitely elevated—1.88 mm. per minute. Serologic tests for syphilis, blood sugar level, gastric analysis, stool examination, chest x-ray and complete gastrointestinal series were negative.

The diagnosis at this time was mild idiopathic thrombocytopenic purpura.

Three weeks later, on July 27, 1949 the patient was admitted to the hospital because of intermittent fever which had been present for 2 weeks. She also complained of diffuse, transitory joint and muscle aching, 2 or 3 loose bowel movements daily, and increasing weakness. There had been a loss of 10 pounds in weight during the past 2 months. The temperature on admission was 101.3 F., the pulse 108 beats per minute, the blood pressure 135/75 mm. Hg. Physical examination revealed no abnormal findings except for a palpable and movable right kidney. Complete blood studies again were essentially normal except for a platelet count of 80,000 per cu. mm. and 7 per cent eosinophiles. Repeated blood and urine cultures were sterile. During the 10 days of hospitalization the evening temperature was consistently elevated to about 102 F. A trial of aureomycin therapy resulted in no improvement.

During the next few months after discharge from the hospital the patient's general condition improved, the fever gradually disappeared, and there was a weight gain of 5 pounds. In October 1949 the cramping abdominal pains returned and sudden exacerbation of the pain on October 5 resulted in rehospitalization. At this time the blood pressure was 155/90 mm. Hg. It was noted that the temporal arteries were tortuous, thickened and dilated. No definite nodules were present and the arteries were neither painful nor tender although pulsations in them were bothersome. Urinalysis on this occasion revealed a trace of albumin and numerous red blood cells in the centrifuged specimen. The total white blood cell count was not elevated but the differential count revealed 5 per cent eosinophiles.

A biopsy specimen of the thickened right temporal artery was obtained. Pathologic report by Dr. John B. Hazard noted the following: "Longitudinal section of the artery reveals areas of intimal thickening with foci of infiltration by polymorphonuclear leukocytes and areas of fibrinoid necrosis. Cross sections of the artery show the same type

of intimal thickening, fibrinoid necrosis, and occasional polymorphonuclear leukocytes. Diagnosis: Arteritis, acute. So-called periarteritis nodosa." (Figs. 1 and 2).

During the next few weeks the condition of the patient rapidly deteriorated. The blood pressure increased to a level of 180/120 mm. Hg., the pulse rate became more rapid—120 to 140 beats per minute, and a moderate fever of 100 F. to 101 F. persisted. Cardiac auscultation revealed protodiastolic gallop rhythm; cardiac enlargement was demonstrated by x-ray examination. Renal failure became evident and on November 2 the blood urea was 144 mg. per 100 cc.; creatinine 3.0 and plasma CO_2 24.5 vols. per cent. Terminally there was complete arterial occlusion of the right leg with incipient gangrene of the foot. There was severe cyanosis and coldness of the terminal phalanges of all fingers, and toes of the left foot. The patient died on November 4, 1949, 5 months after onset of the final illness. Permission for postmortem examination was refused.



FIG. 1. Cross section temporal artery showing intimal thickening, medial necrosis with fibrinoid degeneration and hemorrhage, and polymorphonuclear infiltration (H. and E. $\times 50$).

Comment

It should be emphasized that the anemia was extreme; the initial blood count being 700,000 red blood cells per cu. mm. with a hemoglobin of 3 Gm. Gradual improvement took place over a period of 1 year, at which time the patient considered herself to be in good health for an interval of 18 months.

The terminal illness was accompanied by purpura at the onset, but eventually showed all the cardinal clinical features of periarteritis nodosa and was proved by biopsy.

While the development of periarteritis nodosa after recovery from severe acquired hemolytic anemia could have been coincidental, it appears more likely that some underlying immunologic derangement might have been responsible. Dameshek has speculated that, in his patients in whom the diseases occurred concurrently, the administration of some medication such as penicillin, given in several courses, might result in hypersensitivity with the development (a) of the vascular allergy, periarteritis nodosa and (b) of an immunohemolytic mechanism, acquired hemolytic anemia. In our patient no such

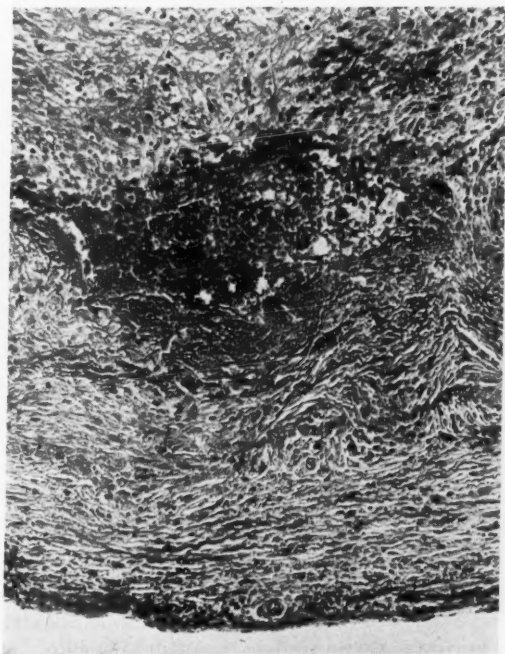


FIG. 2. Longitudinal section of temporal artery (H. and E. $\times 100$).

definite relationship was evident. It is noteworthy that thrombocytopenic purpura occurred with the periarteritis nodosa rather than an exacerbation of the previous hemolytic anemia, as one might have expected.

Summary

Another instance of the association of acquired hemolytic anemia and periarteritis nodosa has been presented. In this case fatal periarteritis nodosa occurred 18 months after complete remission of the hemolytic anemia and was associated with thrombocytopenic purpura.

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CANCER OF THE FACE AND MOUTH

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Department of Plastic Surgery

THE problems of diagnosis and treatment of malignancies of the face and mouth differ from those encountered in the management of neoplasms elsewhere in the body. Early diagnosis is the rule rather than the exception, since face and mouth lesions are usually noticed by the patient early in their course, and readily found by the examining physician. Therapy is complicated by the facial features and functioning organs whose involvement and removal may produce major cosmetic and functional deformity. Despite these differences, the application of sound surgical principles is the basis of treatment; the initial lesion must be eradicated as early in the course of the disease as possible, with removal of regional sites of metastasis when indicated. The only limitation to radical therapy is the production of cosmetic or functional deformity incompatible with a reasonably satisfactory existence.

Two modes of treatment are available: irradiation and surgery. These should not be considered antagonistic since the size, location and radiosensitivity of a given lesion may demand the use of one or the other, or both, to offer the best possibility of cure. For example, irradiation in the form of interstitial radon or radium gives excellent results when used for most intraoral lesions which, in general, are highly radiosensitive. Surgical removal of the same lesions may be difficult and often less satisfactory. In the management of metastatic cancer in the neck, however, the value of irradiation remains unestablished, and surgery is the treatment of choice. Many lesions, particularly of the face, may be adequately treated by either method with comparable results.

In the surgical excision of face and mouth neoplasms, the knife is usually preferable to the cautery, and is essential if any type of primary repair is to be carried out. However, the cautery may be useful in the removal of large tumors, particularly within the oral cavity where bleeding may be severe and difficult to control. While the third degree burn produced by the cautery makes primary wound closure impossible, it also provides a poor bed for the surgical implantation of tumor cells.

The general problem of diagnosis and treatment of cancer of the face and mouth may be divided into five categories. First, any patient over the age of forty with a lesion of the face or within the mouth, the identity of which is not obvious, should be presumed to have cancer until proved otherwise. He should be examined carefully, particular attention being given to possible sites of metastasis. An enlarged lymph node in the adult, in the absence of obvious infection, is probably not inflammatory. Second, a biopsy or, in the case of small tumors, biopsy excision, is a necessity requiring the assistance of an experienced pathologist. However, it must be remembered that a negative

biopsy report does not exclude the presence of cancer, since malignant tissue may occupy only a small portion of the lesion. Third, with the diagnosis of malignancy established, vigorous therapy is undertaken. If the primary disease is not controlled, one cannot expect to treat its metastases successfully. Fourth, an evaluation is made of the lymph nodes draining the area of the primary cancer. If there are palpable nodes, regional block dissection is probably indicated. If involved glands are clinically absent, a decision must be reached as to the advisability of regional dissection on the basis of possible undetected involvement, or the probability of future metastasis. Such prophylactic dissections are carried out most frequently for cancers of the tongue and floor of the mouth. Fifth, after the cancer and any existing metastases have been presumably destroyed, the patient is examined at monthly intervals for at least a year, and every 3 months for several years thereafter. Any departure from this follow-up program must be considered disastrous and is undoubtedly the cause of many avoidable deaths.

Cancer of the Skin

The statement is often made that cancer of the skin is not a serious disease. This is true only from the standpoint of its rate of progression when compared to most other cancers. If allowed to advance to the point of major local destruction or metastasis it becomes a ruthless killer. Fortunately in its early stages it is amenable to eradication and has an excellent chance of permanent cure. Excision of the entire lesion either by means of the knife or the cautery is adequate therapy. On the face, the most common type of neoplasm is the basal cell cancer, often preceded by a long history of roughness, scaliness and ulceration. The more dangerous squamous variety of carcinoma appears less frequently, although it is not uncommon in or near a mucocutaneous junction.

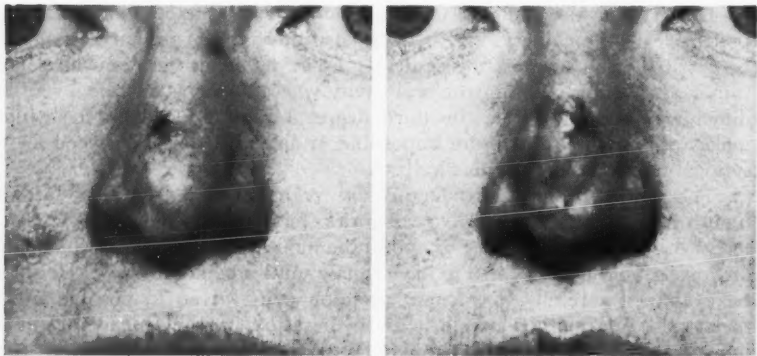


FIG. 1. Squamous carcinoma of nose with ulceration and invasion of cartilage. Lesion and cartilage excised; defect covered with full-thickness skin graft.

The rare "basal-squamous" or mixed carcinoma behaves like its malignant component.

Irradiation of a small, isolated face cancer is adequate in most cases, when carried out by a qualified radiologist. However, lesions of the ear or tip of the nose, where cartilage is close to the site of therapy, are best treated by surgical excision to avoid chondritis or necrosis of underlying cartilage. Tumors of the eyelids, the irradiation of which might produce associated eye damage, should also be excised. In any case, if irradiation is to be the treatment of choice, it must be limited to a single course of therapy. If control is not obtained, the chance of cure by a second attempt is slight and the probability of severe local radiation injury greatly increased. Furthermore, valuable time is lost during which uncontrollable extension or metastasis may take place.

Small lesions are usually amenable to surgical removal without the production of deformity. However large excisions, particularly those in which a prominent feature such as full-thickness cheek or the tip of the nose must be sacrificed, may leave serious cosmetic defects requiring secondary plastic procedures. In some cases the process may be extensive enough to demand neck dissection and jaw resection, removal of the entire nose, or excision of the bony orbit. Physicians often feel that such radical surgery is unjustifiable. It is important to keep in mind that a fatality is the only alternative. The final choice must be made by the patient; only rarely does the individual with far-advanced carcinoma refuse any procedure which offers a chance of saving his life.

One can expect almost 100 per cent cures following satisfactory treatment of small skin neoplasms. The prognosis becomes worse as the lesion grows, approaches mucosal surfaces, or metastasizes to regional lymph nodes.

Cancer of the Lip

Cancer of the lip is almost always squamous, and limited to the lower lip. It is ten times as common in men as in women, a phenomenon for which there is no completely satisfactory explanation. It is often preceded by a long period of chronic irritation, with prolonged exposure to sunlight a common etiologic factor. Any sore or crack in the vermillion, which remains unhealed despite reasonable therapy, should be presumed malignant.

For the early, previously untreated lesion of the lip, surgery and irradiation again provide equally good results. The type of surgical excision must be determined for each lesion. While the standard "V" makes possible a simple, cosmetic closure, it removes insufficient cancer-bearing tissue in some cases. Some lesions are so superficial that shallow removal of skin alone is adequate; others require the excision of a wide block of skin and soft tissue as far as the lower border of the mandible.

Extension and metastasis of lip cancer are not uncommon. Local progression of the disease may result in involvement requiring resection of a segment of the jaw. If the mental foramen is invaded, mandibular hemisection and disarticulation must be carried out to avoid extension through the alveolar canal. The



FIG. 2. Carcinoma of lip previously treated by intensive irradiation. More than half of lip excised; reconstruction carried out by transposition of pedicle from upper lip.

buccal lymph node lying near the facial artery where it crosses the mandible is often the first site of metastasis with later involvement of nodes in the neck. The treatment of such metastases is complete neck dissection. In view of the increasingly low morbidity and mortality associated with this type of neck dissection, there is little or no reason to do the more limited and questionably adequate suprahyoid or upper neck dissection.

The results of treatment of these lip cancers are excellent, with a survival rate of about 90 per cent of all treated patients for more than 5 years.

Cancer of the Oral Cavity

Cancers of the oral cavity fall into six anatomic groups: tongue; floor of the mouth; buccal mucosa; alveolar ridges; palate; maxilla and mandible. Except for tumors of the jaws, these lesions are predominantly primary squamous carcinomas. Jaw tumors may be primary, of dental or bone origin, or secondary, by extension or metastasis from other areas. The physician usually elicits the history of a sore within the mouth of relatively short duration, often associated by the patient with a tooth extraction or other disease. Syphilis, vitamin deficiencies, leukoplakia, previous irradiation, and other sources of chronic irritation such as the chewing of tobacco or heavy smoking, are frequent etiologic factors. Examination commonly reveals an ulcer with the firm edges and induration of a typical carcinoma, although ulceration may be absent. Metastatic lymph nodes are often found in the neck, particularly near the angle of the jaw.

Mouth cancers as a group progress by direct extension to adjacent structures or by metastasis. The first metastasis is usually to the deep cervical glands in the jugulo-digastric area, with subsequent metastases down the neck. Bilateral metastasis is noted occasionally, most often secondary to midline lesions of the tongue.

CANCER OF FACE AND MOUTH

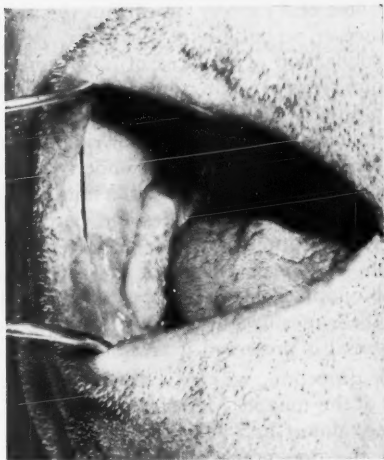


FIG. 3a. Carcinoma of buccal mucosa with extension to mandible and metastasis to neck



FIG. 3b. Patient treated by excision of lesion, jaw resection, and complete neck dissection in continuity. Resected segment of jaw replaced by stainless steel bar.

The treatment of these oral cancers varies with the size and location of the tumor, and the presence or probability of metastasis. Because of the difficulty of obtaining good visualization of the area of involvement, interstitial irradiation by means of radon seeds or radium needles is preferable to excision. The response of these neoplasms to such therapy is most satisfactory. Certain lesions of the jaws, or over the hard palate and alveolar ridges, are best excised or destroyed with the cautery to avoid necrosis of underlying bone. If neck metastases are already present, complete neck dissection on the involved side is indicated. Bilateral neck dissection, if necessary, carries little added risk for the patient if the internal carotid arteries are preserved. A proper neck dissection must extend from the upper border of the clavicle to above the lower border of the mandible, and from the ribbon muscles anteriorly back to the mastoid process and the trapezius muscle. The spinal accessory nerve is usually sacrificed; the hypoglossal is preserved if possible.

Prophylactic neck dissection, without palpable evidence of metastasis, is indicated for cancers of the tongue. Metastasis can be expected in 70 per cent of this group; of these, almost half will have metastasis at the time of initial examination without the presence of clinically involved glands. This alone would justify the prophylactic procedure. In addition, it has been shown repeatedly that one's chance of obtaining a cure is greater if the neck dissection is carried out prior to the clinical appearance of nodes. Other oral cancers, with a lower expected percentage of metastasis, can be followed for the development of neck nodes without significantly diminishing the possibility of cure.

Lesions involving multiple areas or contiguous structures may require radical procedures, with simultaneous removal of neck contents, jaw, floor of the mouth, full-thickness of the cheek, and the like. It is interesting to note that the rate of cure obtained by these massive procedures for extensive disease is better than expected, probably because of the tendency of such lesions to remain of low grade malignancy despite clinical evidence to the contrary.

If a segment of mandible must be resected, jaw conformation is preserved by means of a stainless steel bar to prevent collapse of the pharynx. This bar need not be removed if it is tolerated by the patient.

From the statistical standpoint, one can expect the 5 year survival of 50 to 60 per cent of all patients with cancers of the buccal mucosa, upper alveolar ridge and hard palate. The percentage falls sharply to not over 25 per cent of those with lesions of the tongue, floor of the mouth, and soft palate.

Cancer of the Salivary Glands

Approximately 20 per cent of parotid tumors are malignant, including malignant mixed tumors, adeno- and squamous carcinoma, cylindroma, and muco-epidermoid carcinoma. These cancers are usually diagnosed correctly preoperatively because of their tendency to involve the facial nerve, to be of relatively short duration, and to be fixed to adjacent structures. They only rarely metastasize to other than the regional nodes.

Surgical excision, with radical removal of the tumor including involved

CANCER OF FACE AND MOUTH

filaments of the facial nerve, is the treatment of choice. The presence of metastatic glands may require complete neck dissection carried out in continuity with the primary excision. If the facial nerve must be sacrificed, a secondary suspension of the face by fascial strips gives satisfactory relief from the cosmetic and subjective difficulties of the resulting facial paralysis.

Malignant tumors of the submaxillary and salivary gland are treated similarly. Diagnostically, it must be kept in mind that the incidence of malignancy in these tumors is considerably higher than in those of the parotid and the preoperative diagnosis of cancer is made with less certainty.

The prognosis for salivary gland cancer is variable, depending on the histologic type and amount of progression of the tumor beyond the gland. In general, one can anticipate poor results even from radical surgery.

AN ANALYSIS OF ANESTHESIA ADMINISTRATION FOR 1950

E. L. GLAZENER, M.D. and DONALD E. HALE, M.D.

Department of Anesthesiology

IN 1948, type and methods of administering anesthesia at the Cleveland Clinic Hospital were compared with those of the previous 2 years.¹ Observations were made on the trends as determined from procedures used in the years prior to 1946. The present analysis compares methods and procedures utilized in 1950 with those of 1947. This report for 1950 is based on 8085 anesthetic procedures.

Figures in table 1 indicate the total number of times an agent was used, whether alone or as the primary agent, or as a supplementary agent. The sum of these figures, of course, is greater than the total number of anesthetic pro-

Table 1

Anesthetic Agents	Times Used	Per cent
Pentothal	5064	62.6
Oxygen	4637	57.3
Nitrous oxide	3857	47.7
Procaine	2270	28.0
Cocaine	1695	20.1
Ether	1308	16.1
Pontocaine	1297	16.0
Epinephrine	769	9.5
Curare	491	6.0
Vinethene	330	4.0
Spinocaine	157	1.9
Metycaine	149	1.8
Ephedrine	117	1.4
Avertin	101	1.2
Nembutal	13	0.1

cedures. Those agents in which there was a significant change in the number of times administered were curare and avertin. The use of curare increased from 2.9 per cent of the procedures in 1947 to 6 per cent in 1950. Avertin was used in 2.4 per cent of the procedures in 1947 as compared to 1.2 per cent in 1950. The decrease in the use of avertin reflects a trend to the increased use of rectal pentothal in producing basal anesthesia. Pentobarbital (nembutal) is being used more frequently in the sedation of patients in whom spinal anesthesia must be supplemented. A hypobaric solution of pontocaine (0.2 per cent in distilled water) has replaced spinocaine, and epinephrine has replaced ephedrine as the vasopressor used intrathecally to prolong spinal anesthesia. The usual dose of epinephrine for this purpose is 0.2 mg.

ANALYSIS OF ANESTHESIA ADMINISTRATION

Table 2 represents an arbitrary division of the procedures according to the method of administration. The frequent combination of pentothal and curare

Table 2

Anesthetic Method	Times Used	Per cent
Combined (intravenous and inhalation)	2319	28.8
Spinal	1581	19.4
Inhalation	1530	18.8
Local	1279	15.9
Intravenous (pentothal)	1223	15.0
Caudal (and other regional) . .	153	1.8

with nitrous oxide and oxygen has resulted in the classification: combined (intravenous and inhalation). To avoid endless combinations, all other inhalation technics form one group. Any anesthesia in which ether is used is arbitrarily called an inhalation anesthesia, although the patient may also have received agents which would otherwise cause it to be classed as combined. No inhalation agents other than ether, nitrous oxide, vinethene, and oxygen are used.

Pentothal is used in most inductions in adults who are to be given ether anesthesia, and the use of intravenous or rectal pentothal for induction in children is increasing. In the present classification, "intravenous" includes only those procedures in which pentothal was the only agent administered by the anesthetist, even though some of the patients in this group were given local anesthesia such as topical cocaine for bronchoscopy by the surgeon. Local anesthetics were always administered by the surgeon and were removed from such a grouping if an anesthetist had to administer some other agent for anesthesia.

The number of patients receiving spinal anesthesia is so great it forms its own group. Spinal anesthesia was used in 20.5 per cent of the anesthetic procedures in 1947 and 19.4 per cent in 1950. Of the spinal anesthetics 7.7 per cent utilized the intrathecal catheter technic for continuous or intermittent administration of the anesthetic agents. Continuous spinal anesthesia had decreased from 198 administrations in 1946 to 79 in 1947. During these years, as well as in 1948 and 1949, the malleable needle technic was employed. However, the use of continuous spinal anesthesia had been practically abandoned before 1950 when the catheter technic was first utilized.

Since it is not immediately apparent, it should be pointed out that fewer patients received spinal anesthesia for upper abdominal operations than in the preceding years, but the number of poor risk patients who receive continuous spinal anesthesia have almost made up the difference.

Because of the increased safety and ease of administration of the latter, few regional procedures are carried out other than caudal and transsacral injections. But even here the use of hypobaric pontocaine in water has almost re-

placed caudal anesthesia for proctologic operations. Of the 153 regional anesthetics, all were caudal and intercostal blocks.

Special procedures in anesthesia are attempts to make anesthetic procedures safer for the patient and at the same time to provide better relaxation for the surgeon. Endotracheal administration of anesthetic gases, or simply of oxygen, has firmly established itself as a necessity in numerous operative procedures and desirable in many others. The endotracheal tube was used 65 times in 1946 and 157 times in 1947. However, in 1950, intubation was carried out in 976 patients (nasal route in 135, oral in 841). Not all procedures continue to increase in favor with frequent use. Controlled hypotension by arteriotomy, although still considered safe and apparently sound physiologically, was used 17 times in 1946 and 60 times in 1947 but only 16 times in 1950. Conversely, arterial transfusion continues to gain favor under circumstances in which extreme blood loss requires rapid replacement of blood volume to the arterial tree. Pressure is unhesitatingly employed to accelerate the flow of fluids into the vein when indicated. A MacIntosh safety dropper is used in all pressure infusions to avoid the danger of air embolism.

Transtacheal application of cocaine to the upper trachea, larynx, and pharynx was begun in 1950 and was found to be a safe and efficient method of anesthetizing these structures so that intubation might be carried out at a lower plane of general anesthesia. Indeed, when necessary it has been found more effective and less painful and stimulating to the conscious patient than the usual method of spraying these areas.

Ether was administered only once by vein in 1950, but 5 times in 1947 and 4 times in 1946.

Therapeutic and diagnostic blocks are not included in the total number of anesthetic procedures for operations but are summarized in table 3.

Table 3

Blocks	Times Used
Caudal	180
Paravertebral sympathetic	174
Spinal epidural	120
Intercostal	68
Local infiltration	33
Stellate	19
Phrenic nerve	18
Splanchnic	18
Spinal anesthesia	11

Procaine was given intravenously 92 times for such conditions as rheumatoid arthritis, pruritus of jaundice, and atopic dermatitis. This procedure was used 27 times in 1947.

Recovery Room

The recovery room affords postanesthetic care to hospital and out-patients, including all patients recovering from general anesthesia, or any patient

needing close observation after surgery. Patients remain in the recovery room until they regain consciousness and the blood pressure has become stabilized. It is highly desirable that patients be kept here if any vasopressors are in use.

Maintenance of airways and safe blood pressures are the chief problems of the recovery room. Equipment is kept in readiness for simple transfusions or intra-arterial infusions. Necessary instruments for intubation or tracheotomy are available. Oxygen outlets provide a ready source of oxygen for mask, resuscitator, or catheter. Wall outlets for suction are adjustable so that negative pressure is controlled to suit the need. For intestinal decompression a setting of minus 45 to 50 mm. of mercury is adequate but for pharyngeal suction the setting should be minus 200 mm. of mercury.

The recovery room is staffed by registered nurses assisted by aides, and physician members of the anesthesia staff are always available.

The recovery room has established itself in the esteem of both surgeon and anesthetist. It provides a high standard of professional care for the unconscious or seriously ill postoperative patient and contributes much toward the continued reduction of operative and anesthetic morbidity and mortality.

Reference

1. Curry, G. W. and Hale, D. E.: Statistical analysis of anesthesia at Cleveland Clinic. *Anesthesiology* 10:101 (Jan.) 1949.

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THE FRANK E. BUNTS INSTITUTE

Announces a continuation course for graduate physicians on Thursday, Friday, and Saturday, April 3, 4, and 5, 1952

THE DIAGNOSIS AND TREATMENT OF MALIGNANT DISEASE

Tentative Program

Thursday, April 3, 1952

- | | | |
|----------------|---|---|
| 8:00-9:00 a.m. | Registration—Museum Room | |
| | Morning Session—R. S. Dinsmore, M.D., presiding | |
| 9:00 a.m. | Opening Remarks | R. S. DINSMORE, M.D. |
| | "Premalignant Lesions" | |
| 9:10 a.m. | Premalignant and Malignant Lesions of the Skin | E. W. NETHERTON, M.D. |
| 9:30 a.m. | Premalignant Lesions of Oral Cavity and Larynx | H. E. HARRIS, M.D.
and
WILLARD PARKER, M.D. |
| 9:50 a.m. | Cystic Disease and Papillomas of the Breast | A. H. ROBNETT, M.D. |
| 10:10 a.m. | Thyroid Adenoma | GEORGE CRILE, JR., M.D. |
| 10:30 a.m. | Gastric Ulcer and Gastric Cancer | C. H. BROWN, M.D. |
| 10:50 a.m. | Precancerous Lesions of Colon and Rectum | R. B. TURNBULL, JR., M.D. |
| 11:10 a.m. | Papilloma of the Bladder | W. J. ENGEL, M.D. |
| 11:30 a.m. | Tissue Biopsy and Cytologic Smears in the Early
Diagnosis of Malignant Disease | J. B. HAZARD, M.D. |
| 12:00 a.m. | Cancer of the Lung | H. S. VAN ORDSTRAND, M.D. |
| 12:30 p.m. | Luncheon. Courtesy of Bunts Institute | |

Afternoon Session—George Crile, Jr., M.D., presiding

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|-----------|---|---------------------------|
| 2:00 p.m. | Cancer of the Lip, Tongue and Buccal Mucosa | ROBIN ANDERSON, M.D. |
| 2:15 p.m. | Cancer of the Esophagus | D. B. EFFLER, M.D. |
| 2:30 p.m. | Cancer of the Stomach | S. O. HOERR, M.D. |
| 3:00 p.m. | Cancer of the Biliary Tract and Pancreas | GEORGE CRILE, JR., M.D. |
| 3:30 p.m. | Cancer of the Colon and Rectum | R. B. TURNBULL, JR., M.D. |
| 4:00 p.m. | Panel—Diagnosis of Gastrointestinal Cancer | |

S. O. Hoerr, M.D. (Moderator)
George Crile, Jr., M.D.
E. N. Collins, M.D.
C. R. Hughes, M.D.
H. R. Rossmiller, M.D.

Friday, April 4, 1952

Morning Session—S. O. Hoerr, M.D., presiding

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|------------|---|--|
| 9:00 a.m. | Tumors of the Central Nervous System | A. T. BUNTS, M.D. |
| 9:20 a.m. | Malignant Lesions of the Eye | R. J. KENNEDY, M.D. |
| 9:40 a.m. | Cancer of Sinuses, Tonsils, Pharynx and Larynx | F. R. TINGWALD, M.D. |
| 10:00 a.m. | Sarcoma of the Extremities | J. A. DICKSON, M.D. |
| 10:20 a.m. | Cancer of the Breast | R. S. DINSMORE, M.D.
and
A. H. ROBBETT, M.D. |
| 10:40 a.m. | Cancer of Childhood | R. D. MERCER, M.D. |
| 11:00 a.m. | Leukemia and Lymphoma | J. D. BATTLE, JR., M.D. |
| 11:20 a.m. | Radiation Treatment of Malignancy | U. V. PORTMANN, M.D. |
| 11:40 a.m. | Panel—Cancer of the Thyroid
R. S. Dinsmore, M.D. (Moderator)
George Crile, Jr., M.D.
Brown M. Dobyns, M.D. (Guest)
R. A. Hays, M.D. | |
| 12:30 p.m. | Luncheon. Courtesy of Bunts Institute | |

Afternoon Session—R. B. Turnbull, Jr., M.D., presiding

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|-----------|---|--------------------------------|
| 2:00 p.m. | Panel—Genitourinary Cancer
C. C. Higgins, M.D. (Moderator)
W. J. Engel, M.D.
E. F. Poutasse, M.D. | |
| 3:00 p.m. | Hormonal Chemotherapy in the Treatment
of Cancer | FREDDY HOMBURGER, M.D. (Guest) |
| 3:30 p.m. | The Application of Tissue Culture Technics
in Cancer Research and Diagnosis | T. D. KINNEY, M.D. (Guest) |
| 4:00 p.m. | Panel—Trends in Cancer Research
R. S. Dinsmore, M.D. (Moderator)
Freddy Homburger, M.D. (Guest)
I. H. Page, M.D.
T. D. Kinney, M.D. (Guest) | |
| 8:00 p.m. | Evening Lecture—The Medical Approach to the
Control of Malignant Disease | FREDDY HOMBURGER, M.D. (Guest) |

Saturday, April 5, 1952

Morning Session—R. S. Dinsmore, M.D., presiding

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|------------|---|----------------------------|
| 9:00 a.m. | Precancerous Lesions of the Uterus | J. S. KRIEGER, M.D. |
| 9:20 a.m. | Newer Forms of Nonsurgical Treatment in
Pelvic Malignancy | A. C. BARNES, M.D. (Guest) |
| 10:00 a.m. | Panel—Cancer of the Female Reproductive Tract
George Crile, Jr., M.D. (Moderator)
A. C. Barnes, M.D. (Guest)
R. A. Hays, M.D.
J. S. Krieger, M.D. | |
| 10:45 a.m. | Panel—Present Status of Radical Operations
for Advanced Malignant Disease
R. S. Dinsmore, M.D. (Moderator)
A. C. Barnes, M.D. (Guest)
Freddy Homburger, M.D. (Guest)
Robin Anderson, M.D.
S. O. Hoerr, M.D. | |
| 11:45 a.m. | Concluding Remarks | R. S. DINSMORE, M.D. |

Guest Speakers:

Allan C. Barnes, M.D. — Professor of Obstetrics and Gynecology and Chairman of the Department, Ohio State University, College of Medicine, Columbus, Ohio.

Brown M. Dobyns, M.D. — Associate Professor of Surgery, Western Reserve University School of Medicine and Assistant Chief, Surgical Service, Cleveland City Hospital, Cleveland, Ohio.

Freddy Homburger, M.D. — Research Professor of Medicine, Tufts College Medical School, Boston, Mass.

Thomas D. Kinney, M.D. — Director of Laboratories, Cleveland City Hospital, and Professor of Pathology, Western Reserve University School of Medicine, Cleveland, Ohio.

REGISTRATION BLANK

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THE FRANK E. BUNTS INSTITUTE

Cleveland Clinic

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Cleveland 6, Ohio

Please register me for the course on "Diagnosis and Treatment of Malignant Disease" to be given April 3, 4 and 5, 1952. (Registration Fee is \$15.00, except for interns and residents, and members of the Armed Forces in uniform, who will be admitted free.)

I am enclosing check for \$5.00 and the remainder will be paid on registration, April 3. Checks should be made payable to the Frank E. Bunts Institute.

Name

Address

Medical School and

Date of Graduation

This course is open only to graduates of approved medical schools.